

Volsella modiolus, both from localities in the British Isles.

On November 7, 1942, I accompanied Dr. S. F. Blake, of the U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, on a trip to Point Lookout, in southern Maryland. About 4 miles northwest of the Point the Potomac River has cut back into the land forming a long, low, vertical cliff called Wailes Bluff, well illustrated by Shattuck.³ Exposed in the basal part at and a few feet above water level is compact, blue, sandy marine clay filled with Pleistocene shells. Resting on the blue clay is a lenticular oyster bed and well-stratified, horizontal, dark sandy clay overlain by light-colored cross-bedded sand and gravel belonging presumably to the Talbot terrace of the Pleistocene. Fragmentary leaves and pieces of wood may be had from the lower sandy clay strata of this unit.

At one spot in the lowermost beds along

³ SHATTUCK, GEORGE B. *Pliocene and Pleistocene*. Maryland Geol. Survey, pl. 18. 1906.

BOTANY.—*New bamboos from Szechwan Province, China*.¹ YI-LI KENG and PAI-CHIEH KENG.² Department of Biology, National Central University, Chungking, China. (Communicated by AGNES CHASE.)

In this paper are described four new species and one new variety of Chinese bamboos. One of the species and the variety are known only from sterile specimens, while the descriptions of the other three species are based on their floral parts as well as on their vegetative organs. Illustrations have been prepared for the species with flowers. The types of all are deposited in the Herbarium of the Department of Biology of National Central University.

Sinocalamus distegius Keng & Keng f.

sp. nov.

Fig. 1

Species evidenter cognata *Sinocalamo affini* (Rendle) McClure, ex qua culmo apice num-

¹ Received January 11, 1946.

² In a previous paper by these authors (Journ. Washington Acad. Sci. 35 (12): 374-378, figs. 1-18. 1945.) the junior author's other name, Keng Kwan-hou, was unfortunately used. He expects, however, to use the name Keng Pai-chieh in future publications, hence it is used here.

the bluff I found a large specimen of the snail *Busycon carica* that was filled with blue mud containing numerous small marine mollusks. Not long ago, cleaning out and breaking up this mud, now well dried, I uncovered a right valve (length, 1 cm) of *Arca transversa* to whose interior surface at the pallial line toward the posterior was attached an almost spherical pearl. As *Arca transversa* belongs to a genus whose species do not secrete nacre, or mother-of-pearl, this "pearl" is not a true pearl in the strict sense, although its mode of formation was otherwise undoubtedly similar to that of precious or ornamental pearls. The outside surface of the valve, directly under the pearl, is free of any scar or blemish, thus indicating that the inciting cause of the pearl was not a shell-borer. The location of the pearl at the pallial line just under the mantle, however, as well as its spherical shape, suggests strongly that a sand grain or other irritating object, either organic or inorganic, which the mollusk could not eject, was the cause.

quam pendulo, vaginis culmorum dorso inter pilos setosos valde pruinosis, vaginae nodo quando juvenili pilis retrorsis brunneis dense hirsuto, spiculis majoribus, et ovario pilis hirsutis brevioribus minoribus inferne obsito dif- fert.

Arbor circa 10 m alta, 4.5 cm diametro, apice leviter arcuata sed haud pendula; internodia teretia, pleraque 20-50 cm longa, juvenilia superne leviter pruinosa et pilis albis adpressis deciduis hispida; vaginae culmorum coriaceae, late oblongae, circiter $\frac{1}{2}$ longitudinem internodiorum aequantes, pleraque pilis flavidis vel badiis, dense setosae et juveniles inter pilos farina alba graviter obsitae, basi persistente circa nodos earum annulo pilorum 2-3 mm longorum retrorsorum brunneorum post casum vaginarum facile deciduorum dense hirsutae; limbi longe triangulares vel lanceolati, saepissime erecti, inferiores minores rigidioresque, superiores majores malacioresque; rami numerosi, semiverticillati, ramulis plerisque folia nonnulla ad multa

gerentibus; vaginae foliorum 35–48 mm longae, praeter basin ut in eis culmorum dense retorseque hirsutam glabrae; ligula 0.5–1 mm longa, truncata; laminae anguste lanceolatae, 5–16 cm longae, 8–16 mm latae, acuminatae, supra glabrae, infra pubescentes, utrinque nervis secundariis 4–6 percursae; rami floriferi aphylli vel folia pauca reducta laminis quam vaginis brevioribus ferentes; spiculae vel pseudo-spiculae solitariae vel saepe multae in glomerulum ad quemvis nodum faesiculatae, vel paucae vel plures in axillis foliorum crescentes, 13–18 mm longae, 5–7 mm latae, 4–6-florae, lateraliter leviter compressae, ovato-lanceolatae, fuscae, pedicello circ. 0.5 mm longo fultae; rhachillae articuli 1–2 mm longi, glabri; glumae 1–2, lemmati similes sed multo breviores; lemmata chartacea, latissime ovata, 8–10 mm longa, glabra, multinervia, acuta, basi rotunda, ad margines dense ciliata; palea lemma aequans vel eo aliquanto brevior, bicarinata, inter carinas 2 mm lata binervisque, glabra sed ad carinas marginesque ciliata; lodiculae 3, una posteriore oblongo-ovata, duabus anterioribus dimidiato-ovatis, omnes circ. 2–4 mm longae (cilia includentes); stamina 6, ad maturitatem exserta, antheris pallide flavis, 5–6 mm longis, apice penicillatis, filamentis tenuibus, usque ad 8 mm longis; ovarium cano-albidum, pubescens, pyramidale vel conicum, ventraliter sulco lato canaliculatum, circ. 2.5 mm longum, ad maturitatem 2 mm crassum, stipite circ. 2.5 mm longo stipitatum; stylus subulatus, 2–3 mm longus, pubescens; stigmata 1–2, 5–6 mm longa, asperigilliformia; caryopsis cremeo-flava, fusiformis, circ. 6 mm longa, 3 mm lata.

Culms arborescent, somewhat arched but not drooping at apex, up to more than 10 m tall, 4.5 cm in diameter; internodes terete, greenish or yellowish at maturity, 20–50 cm or more long, the lower with a wall over 5 mm thick, pruinose above and beset with deciduous appressed whitish hairs when young; sheath-nodes prominent, densely hirsute with retrorse brownish hairs 2–3 mm long, but soon becoming glabrous and leathery after the culm-sheaths have fallen off; culm-nodes inconspicuous, dark-colored, 5–10 mm above the sheath-nodes; culm-sheaths coriaceous, 205×115, 250×185, 260×210 mm in size, about half as long as the internodes or less, densely setose with yellowish to brownish hairs (and when

young also covered with a pruinose substance), except for a small glabrous area below the limb, the apex truncate, 2–6.5 cm wide, with rounded shoulders, the base broad, encircling the node once and a half; auricles inconspicuous, sometimes fimbriate with a few whitish setae about 3–5 mm long; ligule truncate, 1–2 mm long, denticulate, the teeth often prolonged into bristles 3 mm long; limb elongate-triangular to lanceolate, scarcely reflexed, the lower 13×5, 30×13, 32×18 mm in size and more rigid, the upper 80×28, 135×32 mm in size and much softer, acuminate with involute margins, constricted at base, glabrous and striate above, scaberulous beneath; branches numerous at each node, semi-verticillate, ascending to spreading, the internodes often 3–13 cm long, 2–3 mm thick, the branchlets bearing several to many leaves; leaf-sheaths straw-colored to brownish, 35–48 mm long, glabrous except the densely and retrorsely hirsute base, as in the culm-sheaths; ligule 0.5–1 mm long, truncate; blades narrowly lanceolate, 50×8, 126×16, 158×14 mm in size, acuminate, rounded or attenuate at base into a petiole 1–2 mm long, dull-green and glabrous above, pale-green and pubescent beneath, with 4–6 secondary nerves on each side, the margins scabrous; flowering branches aphyllous or bearing a few smaller leaves with blades 12–45 mm long, 2–7 mm wide; spikelets several to many at each node and clustered into globular fascicles, or few to several crowded in the axils of the sheaths, 13–18 mm long, 5–7 mm wide, laterally slightly compressed, ovate-lanceolate, dark brown, 4–6-flowered, the pedicel about 0.5 mm long; rachilla-joints 1–2 mm long, glabrous; glumes 1–2, resembling the lemmas but much smaller; lemmas chartaceous, very broadly ovate, 8–10 mm long and wide, glabrous, multinerved, rounded at base, acute, densely ciliate on the margins; palea equaling or somewhat shorter than the lemma, 2 mm wide and 2-nerved between the 2 keels, ciliate on the keels and the margins, otherwise glabrous; lodicles 3, the posterior one oblong-ovate, the anterior two dimidiato-ovate, all about 2–4 mm long (including the cilia); stamens 6, exserted at maturity, the anthers pale yellow, 5–6 mm long, penicillate at the apex, the filaments slender, up to 8 mm long; ovary grayish white, pubescent, pyramidal or conical, ventrally sulcate with a wide furrow, about 2.5 mm long,



FIG. 1.—*Sinocalamus distegius*: 1 and 2, Habit of flowering and leafy branches; 3, culm-sheath, showing dorsal and ventral surfaces; 4, pikelet; 5, palea with rachilla-joint and flower, the lemma removed; 6, stamen. (Type.)

2 mm thick at maturity, stipitate, the stipe about 2.5 mm long, glabrous; style subulate, 2-3 mm long, pubescent; stigmas 1-2, 5-9 mm long, aspergilliform; caryopsis cream-yellow, fusiform, about 6 mm long, 3 mm wide.

Type in the Herbarium of the Department of Biology, National Central University, Chungking, China, collected from stumps of a bamboo-grove, en route from Muh-tung, Pashien to Pai-sha-ching, Nan-ch'uan-hsien, Szechwan Province, September 2, 1943, by Keng & son (no. 3865, a flowering specimen). Other collections of the same species are as follows.

Szechwan: Mount Omei, *H. C. Chow* 8714 (a flowering specimen); en route from Pashien to Nan-ch'uan, Keng & son nos. 3864 (flowering specimen), 3897 (sterile specimen with culm-sheaths), 3898 (flowering specimen with culm), 3901 (flowering specimen with fruits and seedlings), and 3902 (a sterile specimen with leafy branches only).

This species much resembles *S. affinis* (Rendle) McClure in appearance and in the structure of the spikelets, but it differs remarkably in the culms' being erect or slightly arcuate at apex instead of long-pendulous, in the young culm-sheaths dorsally pruinose amongst the setae, and in the sheath-nodes densely hirsute with retrorse brownish hairs. The larger spikelets and the less pubescent ovary of this species also differentiate it from *S. affinis* which was originally described under *Dendrocalamus*.³

Sinocalamus farinosus Keng & Keng f.
sp. nov.

Tametsi inflorescentia huius speciei ignota est, ea *S. affini* (Rendle) McClure et *S. distegio* nobis affinem esse apparet, ab utraque autem in internodiis culmorum brevioribus glabris sed quando juvenilibus albo-pruinosis, et in vaginis culmorum apice truncatis leviter rubro-bruneis cum ligula laciniata optime evoluta instructis differt.

Culmi usque at 10 m alti, 4-6 cm diam., apice leviter arcuati, cum muro circ. 5 mm crasso late fistulosi; internodia teretia, 10-20 cm longa, glabra, ante casum vaginarum viridia et omnino farina alba obsita, ad maturitatem flava lucidaque; nodi vaginarum basibus persistentibus cincti, quando juveniles infra ut

supra eos annulo 3-5 mm lato pilorum velutinatorum flavorum retrorsorum adpressorum obtecti; vaginae culmorum internodiis breviores vel ea circum aequantes, coriaceo-chartaceae, dorso pilis badiis 1-2 mm longis setosae, superne ciliatae, apice circiter 1.5-3 cm latae, truncatae vel leviter concavae; ligula optime evoluta, irregulariter laciniata, circ. 13 mm longa (longitudinem laciniarum includens); limbi reflexi, anguste lanceolati, 4-12 cm longi, 5-12 mm lati, glabri sed ad paginam superiorem marginisque scaberuli; rami ad quemvis nodum numerosi, adscendentes vel horizontales, primarii usque ultra 60 cm longi, ramulis folia 4-9 plerumque gerentibus; vaginae foliorum glabrae, 6-7.5 cm longae, efimbriatae; ligula truncata, circ. 1 mm longa; laminae tenues, lanceolatae, 9-17 cm longae, 15-25 mm latae, acuminatae, basi rotundae vel in petiolum 2 mm longum attenuatae, superne virides lucidaeque, inferne pallidiores minute pubescentesque, utrinque nervis secundariis 5-7 percursae, marginibus scabrae vel altero eorum fere laeves; inflorescentia desiderata.

Culms up to 10 meters tall, about 4-6 cm in diameter, with a wall about 5 mm thick, the internodes terete, 10-21 cm long, those of the young culms green but heavily whitish-pruinose with a ring (3-5 mm wide) of appressed velvety chestnut brown hairs becoming yellowish brown in age, just above and below the sheath-node, the hairs both retrorse and and antrorse below the node but antrorse only above it, the old culms entirely glabrate; sheath-node prominent, 3-5 mm below the inconspicuous culm-node above; culm-sheaths equaling or somewhat shorter than the internodes, reddish brown when young, becoming pale brown at maturity, triangular in outline, 15-21 cm wide, 14-21 cm long, coriaceo-chartaceous, but the margins much thinner, dorsally strigose with blackish hairs 1-2 mm long, truncate or slightly concave and about 1.5-3 cm wide at apex; ligule well developed, about 13 mm long (including the setae), irregularly laciniate into slender setae 7-10 mm long; auricles none; limbs small, reflexed, narrowly lanceolate, 4-12 cm long, 5-12 mm wide, acuminate, constricted near the base, the margins scaberulous, involute, thus rendering the tip subulate, glabrous and striate on the lower but scaberulous on the upper surface; branches numerous at each node, the main ones over

³ *Dendrocalamus affinis* Rendle, Journ. Linn. Soc. Bot. 36: 447. 1904.

60 cm long, 6-7-noded, with internodes 3-12 cm long, 3 mm thick, the intranode⁴ about 5 mm long, whitish-pruinose and bearing a single shell-shaped bud; normal branchlets generally bearing 4-8 leaves; leaf-sheaths glabrous, 6-7.5 cm long, efmbrate, the sheath-nodes 5-7 mm distant; ligule truncate, about 1 mm long; blades thin, lanceolate, 9-17 cm long, 15-25 mm wide, acuminate, rounded or attenuate at base into a petiole 2 mm long, green and lustrous above, paler and minutely pubescent beneath, with 5-7 secondary nerves on each side, the margins scabrous or one of them nearly smooth; vigorous branchlets bearing over 10 much larger leaves, with whitish-pruinose internodes 2-3.5 cm long; leaf-sheaths keeled above, glabrous, but ciliate on the outer margins, 8.5-11 cm long; ligule truncate, 2-3 mm long, sometimes ciliate with few to several fimbriate bristles on one side; blades large, lanceolate or narrowly lanceolate, mostly 27×4.5 cm, rarely shortened to 14 cm long or narrowed to 2.5 cm wide, pale green and densely pubescent beneath, with 7-10 secondary nerves on each side, irregularly and inconspicuously tessellate, the margins setulose-scabrous; inflorescence wanting.

Type in the Herbarium of the Department of Biology, National Central University, Chungking, China, collected along open field-side in Fu-lu-kuan, en route from Nan-ch'uan city to Pai-sha-ching, Nan-ch'uan-hsien, Szechwan Province, September 9, 1943, by *Keng & son* (no. 3896). Another specimen of the same species was collected at Ch'ing-lung-tsu, en route from Pai-sha-ching, Nan-ch'uan-hsien to Shuang-tz'u-ch'ang, Pa-hsien of the same province, September 10, 1943, by *Keng & son* (no. 3899).

This species seems to be related to *S. affinis* and *S. distegius*, from both of which it differs, however, in having culms with shorter glabrous but whitish-pruinose internodes when young, and truncate somewhat reddish-brown culm-sheaths with very well developed lacinate ligules.

The vernacular name of this bamboo is "Liang-shan-tz'ü," but whether this bamboo was originally raised at Liang-shan-hsien, also

a district of Szechwan, is uncertain. In the region where this species was collected, it often grows by the side of *S. distegius* but is less common than the latter. This bamboo is used at Nan-ch'uan as a material in paper-industry.

***Bambusa sinospinosa* McClure var.
inermis Keng & Keng f., var. nov.**

Secundum culmi vaginas internodia arcte amplectantes, tarde deciduas, confertim coriaceas, quando juveniles virides sed pigmento aurentiaco leviter tinctas, ad maturitatem stramineas, longitudine striatas, et glabras sed basi circa nodos earum annulo 3-4 mm lato pilorum velutinosorum badiorum cinctas, haec planta *Bambusae sinospinosae* McClure proximè accedit. Ab specie posteriore haec varietas culmis ramisque inermibus solum recedit.

Culmi 3-5 m alti, usque ad 10 cm diametro; internodia teretia, juvenilia praesertim prope nodos pruinosa, viridia sed ut in vaginis culmorum pigmento aurantiaco leviter tincta, inferiora 25-30 cm longa; rami ad quemvis nodum 1-3, inermes, internodiis inferioribus 8-18 cm longis, circ. 7 mm crassis, angustissime fistulosis, ramulis folia nonnulla ferentibus; laminae foliorum longe ovatae vel lanceolatae, 11-24 cm longae, 28-45 mm latae, basi cuneatae, petiolo 3-5 mm longo fultae, subtus costam primam prominentem habentes, utrinque nervis secundariis 7-9 percursae; inflorescentia desiderata.

Culms 3-5 meters tall, up to 10 cm in diameter, the internodes terete or shallowly grooved on the gemmiferous side, glabrous but pruinose when young especially near the nodes, green or slightly orange-colored, the basal ones 25-30 cm long; sheath-node prominent with persistent sheath-base, about 5-8 mm (the length of intranode) below the elevated or inconspicuous culm-node; culm-sheaths tight, tardily deciduous, thickly coriaceous but thinner and membranous towards the margins, greenish and orange-tinged when young, stramineous at maturity, longitudinally striate, dorsally glabrous, but with a velvety ring of brownish hairs at base around the node, roughish and striate within; ligule well developed, membranous, about 5 mm long, erose; auricles none; limbs erect, dorsally glabrous as in the sheaths, setulose with brownish hairs between the nerves within especially towards the base, the margins involute, cartilaginous and

⁴ A new word signifying the portion where the diaphragm grows inside the culm and from which the buds or branches arise. Its length is limited by the sheath-node below and the culm-node above.

smooth; bud large, solitary, about semicircular in outline; branches 3 at each node, or only one through the abortion of the lateral ones, enclosed at base with a series of successively longer scales (the largest up to 8.5 mm long, pale stramineous, glabrous, dorsally keeled, obtuse or mucronate), the primary ones with basal internodes 8–17.5 cm long, about 7 mm in diam. with a calibre 2 mm across, bearing a few foliiferous branchlets with several to 10 leaves; leaf-sheaths about 8–12 cm long, pale brown, dorsally densely hispidulous with readily deciduous antrorse brownish hairs, truncate at apex, the margins scarious; ligule about 1 mm long, fringed at apex with fragile whitish bristles up to 5 mm long; blades ovate oblong to lanceolate, often cuneate at base with a petiole 3–5 mm long, acuminate, 11–24 cm long, 28–45 mm wide, deep green above, grayish green beneath, the midrib prominent, with 7–9 secondary nerves on each side, the cross veinlets inconspicuous, both margins scabrous; inflorescence wanting.

Type in the Herbarium of the Department of Biology, National Central University, Chungking, China, collected on slope in front of a cottage, enroute from Shuang-tz'ü-ch'ang to Mu-tung, Pa-hsien, Szechwan Province, September 10, 1943, by Keng & son (no. 3903). There are three sheets selected as the type of the species, one representing the culm, one the culm-sheath, and the other the leafy branch.

According to the shape, texture, and other characteristics of the culm-sheaths, and the branching system of the culm, this plant undoubtedly belongs to *Bambusa sinospinosa* McClure.⁵ Since it bears no spines—the reduced hardened branches or branchlets—on the culm or branches, the epithet *inermis*, meaning unarmed, is taken as the varietal name.

***Bambusa rigida* Keng & Keng f., sp. nov.**

Fig. 2

Species probabiliter affinis *Bambusae nanae* Roxburgh, ex qua culmo multo altiore crassioreque, internodiis glabris pruinosis, et culmi vagina cum auriculis duabus prominentibus fimbriatis appendiculata insigniter differt.

Culmi 5–10 m alti, 2–5 cm in diametro, erecti vel apice leviter arcuati, internodiis inferioribus

23–35 cm, superioribus usque ad 45 cm longis, anguste fistulosis, rigidis, glabris sed juvenilibus copiose albo-pruinosis; vaginae culmorum pallide brunneae, confertim chartaceae, pleraeque circ. $\frac{1}{2}$ longitudinem internodiorum aequantes, tarde deciduae, dorso setis prompte deciduis badiis unilateraliter strigosae, apice truncatae vel leviter convexae, utrinque auriculatae, auricula maxime prominente, semi-orbiculata, obscure brunnea, saepissime 5–15 mm longa, 15–30 mm lata, cum setis multis circ. 1 cm longis fimbriata; ligula 2–4 mm longa, aliquanto erosa vel dentata; limbi erecti vel reflexi, triangulares vel multo elongati, quam vagina facilius decidui et plerique breviores, ad paginam superiorem inter nervos minute setulosi; rami nonnulli vel multi, adscendentes vel patentes, primarii internodia inferiora 5–10 cm longa, 4–6 mm crassa habentes, ramulis superne folia 2–12 inferne vaginas 2–4 sine laminis ferentibus; vaginae foliorum 25–70 mm longae, arcte equitantes, striatae, glabrae sed apice setis 3–9 mm longis paucis deciduis saepe fimbriatae; ligula truncata, 0.5–1 mm longa; laminae tenues, aliquanto plicatae, oblongae vel anguste lanceolatae, 8–24 cm longae, 8–27 mm latae, tenuiter acuminatae, basi in petiolum 2–4 mm longum attenuatae, glabrae vel ad paginam inferiorem saepe puberulae, utrinque nervis secundariis 4–9 percursae sed non tessellatae; rami floriferi aphylli vel quando juveniles folia ferentes; spiculae ad quemvis nodum ramorum veteranorum plerumque multae in massam globularem aggregatae, sed eae in ramis juvenilibus solitariae vel nonnullae congestae, meliore evolutae, 3–4 cm longae, lucide virides vel stramineae, 3–5-florae, cum series squamarum deinceps longiorum subtentae; rhachillae articuli compressi, 2–4 mm longi, glabri sed apice cupulari inconspicue puberuli; gluma vel squama infra spiculum maxima circ. 6 mm longa, ovata, multinervis; lemmata lanceolata, 1–1.5 cm longa, 4–8 mm lata, glabra, dorso superne purpurea, multinervia, costa prima in carinam elevata; palea lemmate paullo brevior, crenea, bicarinata, inter carinas 2 mm lata 5-nervisque, carinis superne ciliatis; lodiculae 3, una posteriore lanceolata, duabus anterioribus dimidiato-ovatis, omnes circ. 3 mm longae, albo-scariosae, inferne nervosae, superne longe ciliatae; stamina 6, antheris linearibus, 4–6 mm longis, purpureis vel pallide flavis, apice penicillatis,

⁵ Lingnan Sci. Journ. 19 (3): 411. pl. 19. 1940.

demum exsertis pendulisque, filamentis juvenilibus brevissimis, ad maturitatem usque ad 8 mm longis; ovarium triquetrum vel seriore globulare, stipitatum, circ. 2 mm longum, omnino pilis albidis hirtellum; stylus 1, puberulus, circ. 2 mm longus; stigmata 3, plumosa, brevissima; fructus immaturus.

Culms 5–10 m tall, 2–5 cm in diameter (breast high), erect or slightly arcuate at apex, the lower internodes 23–35 cm, the upper up to 45 cm long, narrowly fistulose with a calibre about 1.5–3 cm across and a wall 1–1.5 cm thick, rigid, glabrous but copiously whitish-pruinose especially when still enclosed by the sheaths; culm-sheaths pale brown, thickly chartaceous, generally about half the length of the internodes, tardily deciduous, dorsally strigose on one side with readily deciduous chestnut-brown setae, truncate or slightly convex at apex, auriculate on both sides, the auricles very prominent but often unequal in size, semicircular, dark brown, mostly 5–15 mm long, 15–30 mm wide, fimbriate with many bristles about 1 cm long; ligule 2–4 mm long, somewhat erose or dentate; limbs erect or reflexed, triangular or much elongate, more readily deciduous and generally shorter than the sheaths, dorsally glabrous or rarely setose as in the sheaths, minutely setulose between the nerves within (on the upper surface of the limb); branches several to many at each node, ascending or spreading, the primary ones with lower internodes 5–10 cm or more long, 4–6 mm thick, the branchlets 2 to several at each node of the relatively main axis, bearing 2–12 leaves above and 2–4 bladeless sheaths below; leaf-sheaths 25–70 mm long, those with blades keeled above, tightly overlapping, striate, glabrous but often fringed at apex with a few deciduous pale to blackish bristles 3–9 mm long; ligule truncate, 0.5–1 mm long; blades thin, somewhat plicate, oblong or narrowly lanceolate, 8–24 cm long, 8–27 mm wide, finely acuminate, attenuate at base into a petiole 2–4 mm long, glabrous or the paler lower surface frequently puberulent, with 4–9 secondary nerves on each side but with no cross veinlets, the margins scaberulous or one of them nearly smooth; floriferous branches aphyllous or with leaves when young; spikelets on young branchlets solitary or several together at each node, but on the old branches mostly numerous and crowded into a globular mass at a node, these

crowded spikelets usually smaller, about 15 mm long, 3–4-flowered (all florets examined containing stamens only), subtended by many small scales, the solitary spikelets much better developed, 3–4 cm long, light-green or stramineous, 3–5-flowered, subtended by a series of successively longer scales; rachilla-joints compressed, 2–4 mm long, glabrous, but inconspicuously puberulent at the cupular apex; glume or the largest scale below the spikelet about 6 mm long, ovate, multinerved, the midnerve often keeled; lemmas lanceolate, 1–1.5 cm long, 4–8 mm wide, glabrous, dorsally purplish above, multinerved, the midrib elevated into a keel; palea slightly shorter than its lemma (in the crowded spikelets, the palea only about 5 mm long), creamy, 2-keeled, about 2 mm wide and 5-nerved between the keels, the latter ciliate above; lodicules 3, the posterior one lanceolate, the anterior two dimidiate-ovate, all about 3 mm long, whitish-scarious, nervose below, long-ciliate above; stamens 6, the anthers linear, purplish or light-yellow, 4–6 mm long, penicillate at apex, finally exserted and pendulous, the filaments about 1–2 mm long when young, but at maturity up to 8 mm long; ovary triquetrous or later becoming globular, stipitate, about 2 mm (including the stipe about 1 mm) long, entirely hirtellous with whitish hairs; style 1, puberulent, about 2 mm long; stigmas 3, plumose, less than 1 mm long; fruit immature.

Type in the Herbarium of the Department of Biology, National Central University, Chungking, China, collected on open roadside slope opposite the city of P'êng-shan-hsien, across the river of Min-chiang, Szechwan Province, August 17, 1942, by *Keng & son* (no. 3742). Three sheets of this number have been selected as type of this species, one representing the inflorescence, one the culm-sheaths, and the other the leafy branches. Other collections of the species are as follows:

Szechwan: Along river banks of Sun-ch'i-ho Chia-t'an-ch'ang, Chiang-ching-hsien, *M. C. Ts'eng* without number (flowering specimen collected November 29, 1939); on slope at right side of Ling-ying-ssü, Kuan-tu, Hoch'uan-hsien, April 4, 1943, *Keng f.* 5015 (flowering specimen); en route from Erh-t'ang to Ch'ing-liang-ssü, Pa-hsien, October 25, 1941, *Keng* 3681 (sterile specimen); open ground of the University campus, Sha-p'ing-pa,

Chungking, November 16, 1941, *Keng f.* 3692 (sterile specimen); Chang-chia-wan, T'ang-hsia-k'ou, T'ung-liang-hsien, altitude 700 meters, February 27, 1940, *K. S. Soo* 3 (sterile specimen).

This species is probably related to *Bambusa nana* Roxb.,⁶ from which it is easily distin-

⁶ ROXBURGH, Fl. Ind. ed. Carey 2: 190. 1824.

guished by the much taller and thicker habit, the glabrous but pruinose internodes, and by the culm-sheaths appendaged with 2 very prominent fimbriate auricles. The native name of this bamboo is "Y'ing-t'ou-huang" from its culms, which are rigid and with a small calibre. The culms are usually used as poles of sedan-chairs, but are not suitable for textile purposes.

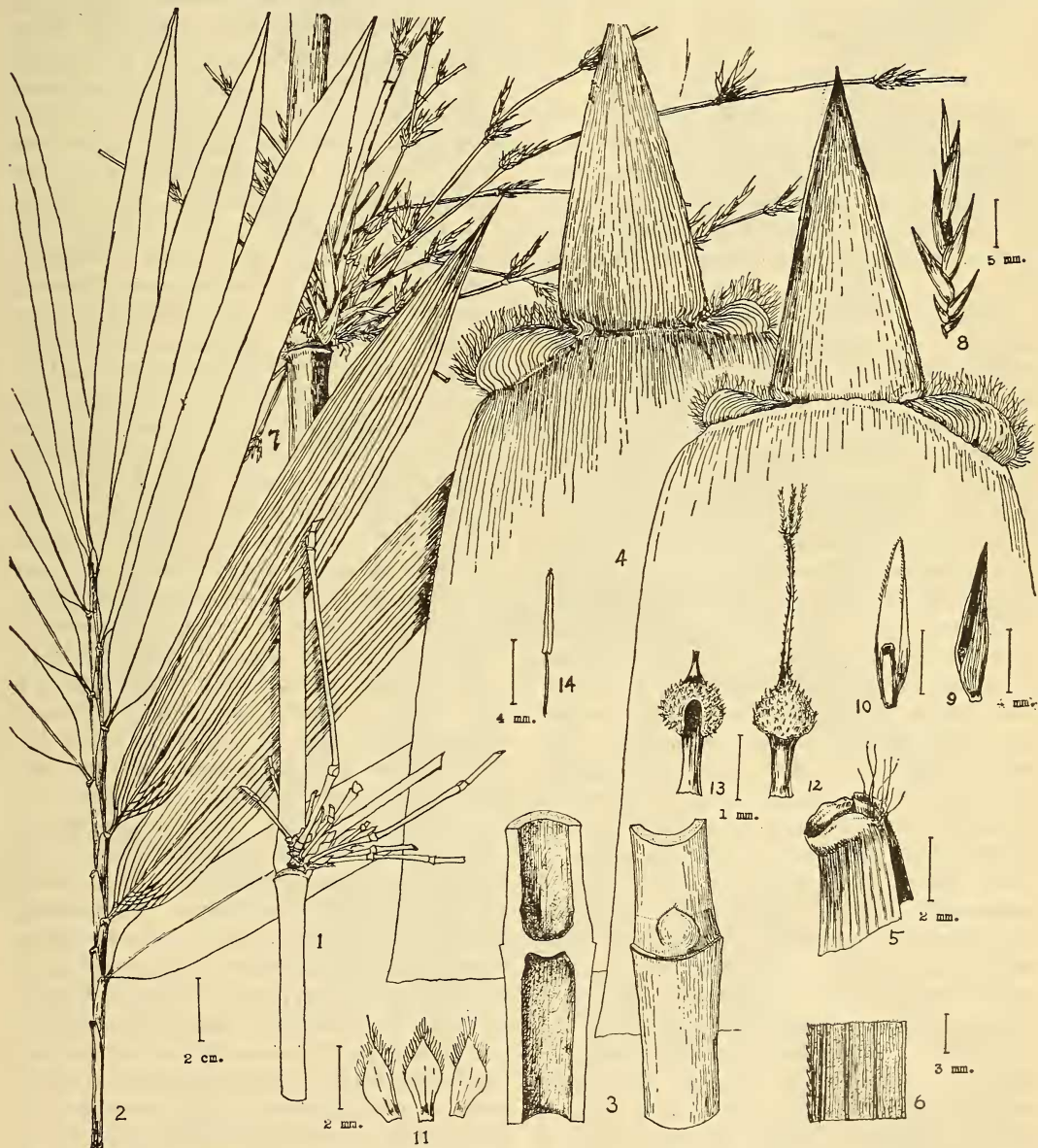


FIG. 2.—*Bambusa rigida*: 1, Habit of branching system; 2, leafy branchlet; 3, part of culm showing the diaphragm and bud of a node; 4, culm-sheath showing dorsal and ventral surfaces; 5, apex of leaf-sheath; 6, part of lower surface of leaf-blade; 7, upper part of culm with flowering branches; 8, spikelet; 9, floret; 10, palea with rachilla-joint attached; 11, lodicules; 12, pistil; 13, ventral view (the side facing the palea) of ovary; 14, stamen. (Type.)

Bambusa fecunda McClure,⁷ described from Hainan, bears the same vernacular name, but its scant description reveals that the culms are at first sericeous below the nodes and the limbs longer than the glabrous waxy culm-sheaths. The species here described has glabrous but farinose culms and prominently auriculate culm-sheaths mostly longer than the limbs.

Arundinaria pedalis Keng, sp. nov.

Fig. 3

Species *Arundinariae fargesii* E. G. Camus affinis, ex qua paniculis simplicibus vel racemis spicularum 4-8, et flosculis minoribus cum palea ejus lemma aequante instructis praecipue differt; laminae foliorum huius speciei etiam multo minores cum nervis secundariis paucioribus.

Suffrutex; internodia rhizomatis 5-20 mm longa, 2 mm crassa; culmi (inflorescentiam includentes) circ. 30 cm alti, internodiis inferioribus nudis, 1-5 cm longis, 1-1.5 mm crassis; vaginae foliorum 2-4.5 cm longae, equitantes, efimbriatae; ligula firma, circ. 1 mm longa; laminae herbaceo-chartaceae, 6.5-15 cm. longae, 9-17 mm latae, acuminatae, petiolis 2-4 mm longis fultae, nervis secundariis 5-7 utrinque percursae; inflorescentia spicularum 4-8 composita, inferne inclusa vel breviter exserta, 10-11 cm longa, rhacheos internodiis pubescentibus 1-3 cm longis; pedicelli compressi, erecti vel leviter adscendentes, circ. 2 mm vel inferiores usque ad 2 cm longi, dense praesertim versus apicem adpressi-pubescentes; spiculae 4-11-florae, 2-6 cm longae, 3-5 mm latae, fuscae vel fusco-brunneae, rhachillae articulis compressis, inter flores 4-5 mm longis, versus apicem dense adpressi-pubescentibus vel velutinis; glumae 3-4, membranaceae, superne pubescentes, prima 4-5 mm, tertia vel quarta 7-8 mm, longa; lemmata 7-10 mm longa, subulato-pungentia, callo pilis canis circ. 0.8 mm longis dense adpressi-pubescente; palea ejus lemma aequans, carinis infra apicem minute hispidulum leviter scaberulis, ceteroqui levibus; lodiculae 3 mm longae, superne fimbriatae; antherae 5-6 mm longae, nigrescentes vel purpureae; stigmata 2, pallida vel crenea, prope medium flosculi lateraliter exserta; caryopsis immatura.

Dwarf bamboos from monopodial horizontal rhizome with internodes 5-20 mm long, 2 mm thick; culms or leafy shoots about 15 cm tall, ending in 1-2 leaves with blades, frequently with solitary erect or ascending branches below, the lower internodes naked, 1-5 cm long, 1-1.5 mm thick; sheaths 3-5 towards the apex of the culms or branches, 2-4.5 cm long, equitant, efimbriate, glabrous or pubescent above, the outer margins usually ciliate; ligule firm, about 1 mm long, frequently fimbriate at its apex with setae 1-2 mm long; blades herbaceous-chartaceous, 6.5-15 cm long, 9-17 mm wide, acuminate, rounded or attenuate at the base into a petiole 2-4 mm long, glabrous or the paler lower surface puberulent when young, with 4-6 secondary nerves on either side, distinctly cross-veined, the margins setulose-scabrous above, nearly smooth below; flowering branches usually solitary at the lower nodes of the culm, 20-25 cm (including the inflorescence), long, 2-noded, the internodes up to 9 cm long, pubescent around the nodes, aphyllous but enclosed by sheaths 2.5-5 cm long; inflorescence a panicle or raceme of 4-8 spikelets, included below or shortly exserted, 10-11 cm long with pubescent rachis joints 1-3 cm long; pedicels (or branches) compressed, erect or somewhat ascending, about 2 mm or the lower ones up to 2 cm long, densely appressed-pubescent especially towards the apex; spikelets 4-11-flowered, 2-6 cm long, 3-5 mm wide, dusky or dark-brown; rachilla joints compressed, 4-5 mm long between the florets, densely appressed-pubescent or velvety towards the apex; glumes 3-4, membranous, successively longer, pubescent above, the first 4-5 mm, the third or fourth 7-8 mm long; lemma herbaceous-chartaceous, ovate-lanceolate, 7-10 mm long, more or less pubescent towards the subulate-pungent (rarely acute) apex, multinerved, reticulate between the nerves above, the callus densely appressed-pubescent with grayish hairs about 0.8 mm long; palea equaling its lemma, narrowly lanceolate with broad inflexed sides, the keels slightly scaberulous below the minutely hispidulous apex, otherwise smooth; lodicules 3, reddish-brown, oblong-lanceolate or the anterior two dimidiate-ovate, about 3 mm long, nervose, fimbriate above with longer stiff hairs at the apex; stamens 3, the anthers blackish or purplish, 5-6 mm long; stigmas 2, pale or creamy, about 3 mm long, laterally exserted

⁷ Lignan Sci. Bull. No. 9: 9. 1940.



FIG. 3.—*Arundinaria pedalis*: 1, Habit; 2, spikelet; 3, floret, showing the lemma, palea, and rachilla-joint. (Type.)

near the middle of the floret; caryopsis immature.

Type in the Herbarium of the Department of Biology, National Central University, Chungking, China, a rare bamboo collected on rocky place, P'ang-ch'i, Chiang-pei-hsien, Szechwan Province, February, 1938, by *Ho Ching* (without number).

This small bamboo is probably related to *Arundinaria fargesii* E. G. Camus,⁸ from which it differs mainly in having a simple panicle or raceme of 4-8 spikelets and smaller florets with palea equaling its lemma. The leaf-blades of this species are also much smaller and with fewer secondary nerves on each side than in the latter species.

REFERENCE LIST OF GEOGRAPHIC AND PERSONAL NAMES

Because of the near impossibility of locating on a map of China most geographic names given in romanization only, this reference list with characters is given. The characters are assembled here rather than given in the text in order to simplify the printing problem. American botany is now handicapped by the lack of precision of our early botanists in recording type localities. Although very few people, Chinese or westerners, at this time are interested in the precise type localities of Chinese species, it seems desirable to anticipate future needs and record these localities with all possible accuracy.—E. H. WALKER.

⁸ In Lecomte, Not. Syst. 2 (fasc. 8): 244. 1912.

Ch'a-han-ch'eng 察汗城
Chang-chia-wan 張家灣
Chia-t'an-ch'ang 夾灘場
Chiang-ching-hsien 江津縣
Chiang-pei-hsien 江北縣
Ch'ing-liang-ssü 清涼寺
Ch'ing-lung-tsui 青龍嘴
Chou Hao-ch'ang 周鶴昌
Erh-t'ang 二塘
Fu-lu-kuan 福祿關
Ho Ching 何景
Ho-ch'uan-hsien 合川縣
Huang-yüan-hsien 渙源縣
Keng Kuan-hou 耿寬厚
Keng Pai-chieh 耿伯介
Keng Yi-li 耿以禮
Kuan-tu 官渡
Liang-shan-hsien 梁山縣
Liang-shan-tz'ü 梁山慈
Ling-ying-ssü 靈應寺
Min-chiang 岷江
Mu-tung 木洞
Nan-ch'uan-hsien 南川縣
Pa-hsien 巴縣
Pai-sha-ching 白沙井
P'ang-ch'i 磐溪
P'eng-shan-hsien 彭山縣
Sha-p'ing-pa 沙坪壩
Shuang-tz'ü-ch'ang 雙賜場
Su Chia-hsun 蘇甲薰
Sun-ch'i-ho 筍溪河
Tan-ka-êrh 丹噶爾
T'ang-hsia-k'ou 湯峽口
Ts'eng Mien-chih (Tsen Mill) 曾勉之
Tung-liang-hsien 銅梁縣
Ying-t'ou-huang 硬頭黃

ENTOMOLOGY.—*Synopsis of the cerambycid beetles of the genus Stenosphenus Haldeman found in America, north of Mexico.*¹ W. S. FISHER, U. S. Bureau of Entomology and Plant Quarantine. (Communicated by C. F. W. MUESEBECK.)

In the process of studying and rearranging the species of *Stenosphenus* in the United States National Museum, it was found that the genus had not been treated in a synoptical way since 1885, when Horn published a table for separating the six known species. This table was republished by Leng in 1887. Since that time one

species has been described by Schaeffer, five species by Casey, and four species by Linsley, and it seems advisable to bring our knowledge of the genus up to date.

Genus *Stenosphenus* Haldeman

Stenosphenus Dejean, Cat. Coléopt., ed. 3, p. 330 (nomen nudum). 1835; ed. 3, rev., p. 355 (nomen nudum). 1836; Haldeman, Trans. Amer. Phil. Soc. (ser. 2) 10: 39. 1847; Chevro-

¹ Received January 11, 1946.